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The following lectures outline the characteristics of elementary species, both in nature and in cultivation, and it is shown that natural selection must play a large part in determining their survival. Varieties are shown to differ from elementary species in not possessing anything that is really new, and in originating commonly by the loss of some quality. Several chapters deal with the various kinds of varieties, retrograde, progressive, and ever-sporting; in the same connection the subject of atavism is elucidated, as well as latent characters, and vicinism or variation under the influence of pollination by neighboring individuals. The lectures on mutations deal not alone with *Oenothera*, but as well with the peloric toadflax, double flowers, and a great many wild and cultivated plants that are supposed to illustrate mutation. A lecture that will be read with great interest by paleontologists, as well as others, is the one that considers the periodicity of mutations, and the relation that mutation bears to the length of geological time. The final lectures present the topic of fluctuating variations, and perhaps it is here that Darwinians will find least comfort in the work of DeVRIES. The closing words of the book, quoted from ARTHUR HARRIS, will be recognized as most apt: "Natural selection may explain the survival of the fittest, but it cannot explain the arrival of the fittest."

In a review of *Die Mutationstheorie* (BOT. GAZ. 33:236-239. 1902), it was felt to be too soon to express an opinion concerning the place which that work would occupy in the literature of evolution, although it was the reviewer's intuition that this place would be very high. Of the permanent value of that work, and of the work here under review, there is now no doubt at all. "The greatest contribution since DARWIN" is the universal testimony, and there is a feeling on all sides that the answers to many evolutionary questions are close at hand, and that through the application of experiment. To many of us the new volume brings more than did the old, because we have now seen the author face to face, and have perpetually in mind the modest, lovable man, as well as the renowned investigator.—H. C. COWLES.

#### MINOR NOTICES.

EMERSON<sup>2</sup> has published the results of experiments in the control of the rust and scab of apples. He finds that the rust of apples due to species of *Gymnosporangium* can be prevented by spraying with Bordeaux mixture if the first application is made when the gelatinous spore-containing projections first appear on the "cedar apples." This spraying should then be followed by a second spraying about ten days or two weeks after the first. He recommends also that the cedar apples be removed from cedar trees near orchards in the winter or early spring, and that where practicable cedar trees themselves should not be allowed to remain within one mile of apple orchards. The scab he found could be prevented by spraying twice with Bordeaux mixture, once just before the apple blossoms open and again just after the blossoms fall.—E. MEAD WILCOX.

<sup>2</sup> EMERSON, R. A., Apple scab and cedar rust. Bull. Nebraska Exp. Sta. 88: pp. 21. figs. 9. 1905.

CHRISTENSEN<sup>3</sup> has begun the publication of an *Index Filicum*, which is intended to do for ferns what the *Index Kewensis* does for seed-plants. The book will contain a systematic enumeration of the genera, based upon ENGLER and PRANTL'S *Pflanzenfamilien*; an alphabetical enumeration of species and synonyms, which will include all names and combinations of names published from 1753 to 1905 and also names of garden ferns; and an alphabetical catalogue of literature containing critical notes and descriptions of new genera and species. The work will be complete in eleven or twelve parts, and the entire manuscript is ready for printing, awaiting only a sufficient subscription. The first fascicle, just issued, begins the alphabetical list of genera and species, closing with Aspidium.—J. M. C.

MERRILL<sup>4</sup> has attacked the species described in BLANCO's monumental *Flora de Filipinas*, recognizing that they must be identified and made available so far as possible. He has brought together these identifications in a conveniently arranged bulletin, calling special attention to the species that are yet to be identified. To give some idea of the results attained by this absolutely isolated worker, it may be said that in the two editions of the *Flora* (1837 and 1845) BLANCO described 1127 species and varieties; about 623 of these were proposed as new, and 504 identified with species of other authors, 219 of them correctly and 285 incorrectly. A large proportion of the new species remain unknown, and only 90 are known to be valid.—J. M. C.

HITCHCOCK<sup>5</sup> has published an elaborately illustrated synopsis of the North American species of Agrostis, recognizing twenty-seven species and describing three as new. It is announced as the intention of the department to publish occasional monographs of the larger genera of grasses.—J. M. C.

HUSNOT<sup>6</sup> has published the first part of an illustrated synopsis of the Cyperaceae of France, Switzerland, and Belgium. This part contains Elyna, Kobresia, and Carex. The important characters of each one of the 123 species of Carex are illustrated.—J. M. C.

<sup>3</sup> CHRISTENSEN, CARL, *Index Filicum sive enumeratio omnium generum specierumque Filicum et Hydropteridum ab anno 1753 ad annum 1905 descriptorum adjectis synonymis principalibus, area geographica, etc.* Fasciculus 1. pp. 64. Copenhagen: H. Hagerups Boghandel. 1905. Each part 3s 6d.

<sup>4</sup> MERRILL, ELMER D., A review of the identifications of the species described in Blanco's *Flora de Filipinas*. Bull. 27, Bureau of Gov't. Labs., Department of Interior. Manila. 1905.

<sup>5</sup> HITCHCOCK, A. S., North American species of Agrostis. Bulletin 68, Bureau of Plant Industry, Department of Agriculture. pp. 68. *pls. 37.* 1905.

<sup>6</sup> HUSNOT, T., *Cypéracées: descriptions et figures des Cypéracées de France, Suisse et Belgique*. Part 1. pp. 48. *pls. 12.* Cahan, par Athis (Orne): the author. 1905. 5 fr.